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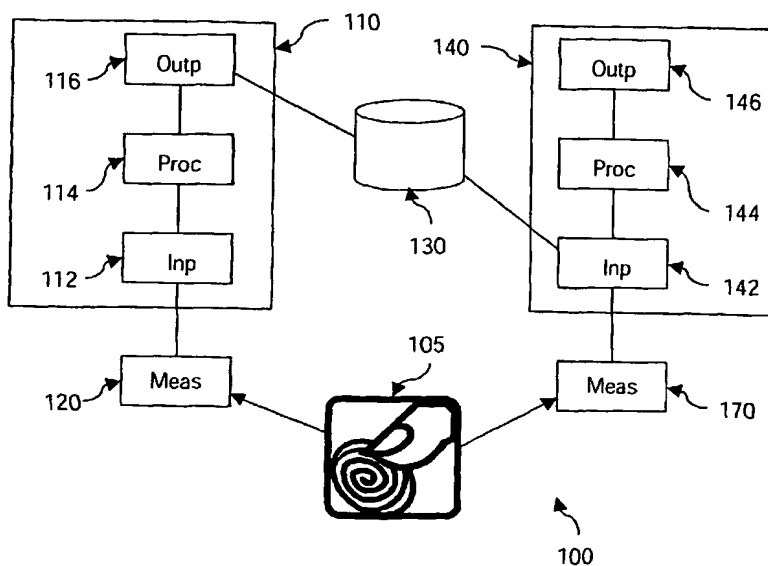
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[Continued on next page]

(54) Title: METHOD AND SYSTEM FOR AUTHENTICATION OF A PHYSICAL OBJECT



(57) Abstract: A system for authenticating a physical object includes an enrolment device, an authentication device, and a storage for storing authentication data. The enrolment device includes an input for receiving a property set Y of the object measured using a measurement procedure. A processor is used for creating a property set I from the measured property set Y that meet a predetermined robustness criterion. It then creating a property setA from the property set I that includes less information on the actual properties than property set Y, and finally generates a control value Vin dependence on properties of the property set A. An output is used for supplying the control value to the storage as part of the authentication data. The enrolment device operates in an analogous way.

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 291 560 A (DAUGMAN JOHN G) 1 March 1994 (1994-03-01) figure 1 column 4, line 53 - line 68	1-18
A	US 2002/029341 A1 (FRYKHOLM NIKAS ET AL) 7 March 2002 (2002-03-07) abstract	1-18
A	WO 98/12670 A (BORZA STEPHEN J ; FREEDMAN GORDON (CA); DEW ENGINEERING AND DEV LIMITE) 26 March 1998 (1998-03-26) figure 8	1-18
A	MENEZES, VANSTONE, OORSCHOT: "Handbook of Applied Cryptography" 1997, CRC PRESS LLC, USA, XP002298499 page 387 - page 390	1-18

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5291560	A	01-03-1994	CA 2145659 A1	28-04-1994
			WO 9409446 A1	28-04-1994
			AU 2808092 A	09-05-1994
			EP 0664037 A1	26-07-1995
			JP 3307936 B2	29-07-2002
			JP 8504979 T	28-05-1996
			AT 211279 T	15-01-2002
			DE 69232314 D1	31-01-2002
			DE 69232314 T2	20-06-2002
			DK 664037 T3	11-03-2002
			HK 1013156 A1	31-05-2002
US 2002029341	A1	07-03-2002	AT 255787 T	15-12-2003
			AU 3228600 A	14-09-2000
			CA 2362882 A1	31-08-2000
			DE 60006935 D1	15-01-2004
			EP 1149475 A1	31-10-2001
			JP 2002538504 A	12-11-2002
			AU 5120201 A	23-10-2001
			WO 0177792 A2	18-10-2001
			WO 0051244 A1	31-08-2000
WO 9812670	A	26-03-1998	AU 4196497 A	14-04-1998
			CA 2233942 A1	26-03-1998
			WO 9812670 A1	26-03-1998